WHAT IS CLAIMED IS:

1. A method of generating an interpolation image comprising:

dividing a first image into a plurality of first

5   blocks;

searching a second image for a second block having a strong correlation with respect to one of the first blocks every first block;

deriving a first motion vector between the first

10   block and the second block;

extracting a first sub block and a second sub block from the first block, the first sub block including pixels that an absolute difference value is less than a threshold, the second sub block including

15   pixels that the absolute difference value is not less than the threshold, the absolute difference value being an absolute difference value between opposite pixels of the first block and the second block;

searching for a third sub block in a region on

20   the second image, the third sub block having a strong correlation with respect to the second sub block, the region corresponding to a region that the absolute difference value is not less than the threshold;

deriving a second motion vector between the second

25   sub block and the third sub block; and

copying the first sub block and the second sub block onto a third image between the first image and

the second image, using the first motion vector and the second motion vector.

2. The method according to claim 1, wherein searching for the second block includes computing the absolute difference value between opposite pixels of each of a plurality of block candidates of the second image and the first block every pixel, counting pixels that the absolute difference value is less than the threshold to obtain the number of pixels, and selecting as the second block one of the block candidates in a search range that the number of pixels is maximum.

3. The method according to claim 1, wherein searching for the third sub block includes computing second absolute difference value between opposite pixels of the second sub block and each of a plurality of sub block candidates of the second image, counting pixels in the region that the second absolute difference value is less than second threshold to obtain the number of pixels, and selecting as the third sub block one of the sub block candidates in a search range that the number of pixels is maximum.

4. The method according to claim 2, wherein the absolute difference value is a first absolute different value and the threshold is a first threshold, and searching for the third sub block includes:

computing a second absolute difference value of opposite pixels between each of a plurality of sub

block candidates of the second image and the second sub
block every pixel;

counting pixels in the first region that the
second absolute difference value is less than a second
5 threshold to obtain the number of pixels;

counting pixels in the second region on the second
image that the first absolute difference value is less
than the first threshold and the second absolute
difference value is less than second threshold to
10 obtain the second number of pixels; and

selecting as the third sub block one of the second
sub block candidates that sum of the number of pixels
and the second number of pixels is maximum in a search
range.

15 5. The method according to claim 4, wherein the
second threshold is smaller than the first threshold.

6. The method according to claim 4, wherein the
copying includes copying onto the third image the
pixels of the first sub block, a first group of pixels
20 in the first region that the second absolute difference
value is less than the second threshold, and a second
group of pixels in the second region on the second
image that the first absolute difference value is less
than the first threshold and the second absolute
25 difference value is not less than the second threshold.

7. The method according to claim 6, wherein the
copying includes:

obtaining a scale conversion factor by dividing a
first time period between the third image and the
second image by a second time period between the first
image and the second image,

5   obtaining a third motion vector by multiplying the
first motion vector by the scale transfer coefficient,

obtaining a forth motion vector by multiplying the
second motion vector by the scale transfer coefficient,

copying pixels of the first sub block onto the

10   third image based on the third motion vector, and

copying, onto the third image, pixels belonging to
the first group of pixels and the second group of
pixels based on the fourth motion vector.

8. The method according to claim 1, wherein the

15   copying includes obtaining a fourth sub block by
subjecting the second sub block and the third sub block
to weighted average, and copying the first sub block
and the fourth sub block onto the third image, using
the first motion vector and the second motion vector.

20   9. The method according to claim 1, wherein the
copying copies a fourth sub block and the third sub
block onto the third image, the fourth sub block being
on the second block and corresponding to the first sub
block.

25   10. A method of generating an interpolation image
comprising:

dividing an interpolation image between a first

image and a second image into a plurality of to-be-interpolated blocks;

searching for the first block of the first frame and the second block of the second frame, the first block and the second block being in alignment with the to-be-interpolated blocks and having a strong correlation to each other;

deriving a first motion vector between the first block and the second block;

extracting a first sub block and a second sub block from the first block, the first sub block including pixels that an absolute difference value between opposite pixels of the first block and the second block is less than a threshold, the second sub block including pixels that the absolute difference value is not less than the threshold;

extracting from each of the first image and the second image a region including pixels that the absolute difference value is not less than the threshold;

searching for a third sub block of the region of the first image and a fourth sub block of the region of the second image, the third sub block and the fourth sub block being in alignment with the to-be-interpolated blocks and having a strong correlation with respect to each other;

deriving a second motion vector between the third

sub block and the fourth sub block; and

copying the first sub block and the third sub block onto the interpolation image, using the first motion vector and the second motion vector.

5   11.   The method according to claim 10, wherein searching for the first block and the second block includes:

computing an absolute difference value between opposite pixels of the first block candidate of the
10   first frame and the second block candidate of the second frame every pixel,

counting pixels that the absolute difference value is less than the threshold to obtain the number of pixels;

15   selecting as the first block the first block candidate that the pixel number is maximum in a search range, and

selecting as the second block the second block candidate that the pixel number is maximum in a search
20   range.

12.   The method according to claim 10, wherein searching the third sub block and the fourth sub block includes:

computing a second absolute difference value
25   between opposite pixels of the third sub block candidate of the first image and the fourth sub block candidate of the second image every pixel;

counting pixels that the second absolute difference value is less than the second threshold, with both of the pixels less than the threshold and the pixels not less than the threshold existing in the

5   region, to obtain the number of pixels;

selecting as the third sub block the third block candidate that the number of pixels is maximum in a search range; and

selecting as the fourth sub block the fourth block

10   candidate that the number of pixels is maximum in a search range.

13.   The method according to claim 10, wherein searching for the third sub block and the fourth sub block includes:

15   computing a second absolute difference value between opposite pixels of a third sub block candidate of the first image and a fourth sub block candidate of the second image every pixel;

counting pixels of pixel pairs that the second

20   absolute difference value is less than the second threshold, with both of the pixels less than the threshold and the pixels not less than the threshold existing in the region, to obtain the first number of pixels;

25   counting pixels of pixel pairs that the second absolute difference value is less than the third threshold, with the pixels less than the threshold or

the pixels not less than the threshold existing in the region, to obtain the second number of pixels;

counting pixels that the second absolute difference value is less than the fourth threshold, with no pixel less than or not less than the threshold existing in the region, to obtain the third number of pixels; and

selecting a sub block pair of the third sub block candidate and the fourth sub block candidate that a sum of the first number of pixels, the second number of pixels and the third number of pixels is maximum in a search range as the third sub block and the fourth sub block.

14. The method according to claim 13, which includes selecting a region corresponding to the interpolation sub block in the third block as a third sub block, and selecting a region corresponding to the interpolation sub block in the fourth block as a fourth block.

15. An apparatus to generate an interpolation image, comprising

an input unit configured to input a first image and a second image;

a division unit configured to divide the first image into a plurality of first blocks;

a first motion vector detection unit configured to detect a first motion vector by searching the second

image for a second block with a strong correlation with respect to one of the first blocks every first block;

an extraction unit configured to extract from the first block a first sub block and a second sub block, the first sub block including pixels that an absolute difference value between opposite pixels of the first block and the second block is less than a threshold, and the second sub block including pixels that the absolute difference value is not less than the threshold;

a second motion vector detection unit configured to detect a second motion vector by searching a region on the second image that the absolute difference value is not less than the threshold for a third sub block with a strong correlation with respect to the second sub block; and

an interpolation image generation unit configured to generate an interpolation image by copying the first sub block and the third sub block onto a third frame between the first image and the second image, using the first motion vector and the second motion vector.

16. The apparatus according to claim 15, wherein the first motion vector detection unit comprises:

an absolute difference value computation unit configured to compute the absolute difference value between the opposite pixels of a second block candidate of the second image and the first block;

a count unit configured to count pixels that the absolute difference value is less than the threshold to obtain the number of pixels; and

a selection unit configured to select as the

5   second block the second block candidate that the number of pixels is maximum in a search range.

17.   The apparatus according to claim 16, wherein the second motion vector detection unit comprises:

a second absolute difference value computation

10   unit configured to compute a second absolute difference value between opposite pixels of a third sub block candidate of the second image and the second sub block;

a count unit configured to count pixels in the region that the second absolute difference value is

15   less than the second threshold to obtains the number of pixels; and

a second selection unit configured to select as the third sub block the third sub block candidate that the number of pixels is maximum in a search range.

20   18.   The apparatus according to claim 16, wherein the second motion vector detection unit comprises:

a second absolute difference value computation unit configured to compute a second absolute difference value between opposite pixels of a third sub block

25   candidate of the second image and the second sub block;

a second count unit configured to count pixels in the region that the second absolute difference value is

less than the second threshold to obtain the first number of pixels;

a third count unit configured to count pixels in a second region on the second image that the absolute difference value is less than the first threshold, the pixels being pixels that the second absolute difference value is not less than the third threshold, to obtain the second number of pixels; and

a second selection unit configured to select as the third sub block the third sub block candidate that sum of the first number of pixels and the second number of pixels is maximum in a search range.

19. An image display method comprising:

inputting an input image;

generating an interpolation image according to the method of claim 1; and

displaying selectively the input image and the interpolation image.

20. An image display system comprising:

an image input unit configured to input an input image;

the apparatus to generate an interpolation image, according to claim 15; and

a display device to display selectively the input image and the interpolation image.